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EXAMINER	
ROSARIO, DENNIS	
ART UNIT	**PAPER NUMBER**
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/940,432	MURATA ET AL.	
	Examiner	Art Unit	
	Dennis Rosario	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *RCE 6/8/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/8/2006 has been entered.

Response to Amendment

2. The amendment was received on June 8,2006. Claims 1-26 are pending.

Claim Objections

3. Due to the amendment, the objection to claim 10 is withdrawn.

Response to Arguments

4. Applicant's arguments on page 13,lines 6-8 filed 6/8/2006 have been fully considered but they are not persuasive and states:

"...Lelong fails to teach...that the tangible object plane being defined by a spatial orientation of the tangible object..."

However, the examiner respectfully disagrees since Lelong et al. (US Patent 5,444,478 A) discloses that the tangible object plane (fig. 5A, label: "M") being defined by a spatial orientation (of either the coordinate system ($y0,X_0,Z_0$) of an image I_0 or the coordinate system (Y,Z,X,Z_0) of a camera, "P" as shown in fig. 5A) of the tangible object.

5. Applicant's arguments on page 13, lines 16-18, filed 6/8/2006 have been fully considered but they are not persuasive and states:

> "...Lelong fails to teach...the generating of a distortion-corrected image **on a projection plane by projecting the standard image onto the projection plane based on the direction of the tangible object plane**..."

However, the examiner respectfully disagrees since Lelong et al. discloses the generating of a distortion-corrected image (as shown in figures 7A-7C) on a projection plane (as shown in fig. 7C) by projecting the standard image (fig. 7A) onto the projection plane based on the direction (as shown in fig. 5A that describes a coordinate system where one of ordinary skill in the art can use coordinates as directions to find point "M" in fig. 5A. Note that the claimed direction is broad enough that other interpretations are possible. Such as "ray PM" in col. 13, line 61 where ray is interpreted as a pointer to point M in fig. 5A. Upon further review of the specification, especially page 36 with respect to "n", the claimed direction appears to be a normal of a tangible object. If that is correct then a distinction is made in Lelong et al. Referring to fig. 1A, Lelong et al.

shows 90 degree symbols that corresponds to the claimed normal, but the 90 degrees symbols are with respect to the center of the imaging plane and not a tangible plane of the tangible object which is shown in fig. 1A, label: "M" that has no normal at the tangible plane of M. Fig. 1C shows the imaging plane with "m" that represents the tangible plane M where m of the imaging plane has no normal at m; a normal appears to be at the center of the imaging plane and not at the center of the tangible object plane. The same applies for fig. 5A and 5B. Fig. 5B shown ray PM that intersects images I_0 and I_j where at the intersections of the ray there is no angle or 90 degree angle or normal associated with the intersections.) of the tangible object plane.

6. Applicant's arguments on page 14, lines 3-5, filed 6/8/2006 have been fully considered but they are not persuasive and states:

> "...Lelong fails to teach or suggest that an image is automatically selected as the standard image based on a calculated direction of the object plane for each of the partially overlapping image."

However, the examiner respectfully disagrees since Lelong et al. discloses that an image is automatically selected (via fig. 6,numerals 2 and 205 where numerals 2 "controlled automatically" in col. 17, line 14) as the standard image based on a calculated direction (as shown in fig. 5A that describes a coordinate system where one of ordinary skill in the art can use coordinates as directions to find point "M" in fig. 5A) of the object plane for each of the partially overlapping images.

7. Applicant's arguments, see page 14,lines 5,6, filed 6/8/2006, with respect to 102(e) have been fully considered and are persuasive and states:

"Lelong never calculates an object plane, but merely uses a virtual plane I_0 of a virtual camera view C_0."

Upon further review of the specification, this statement is interpreted to mean:

"Lelong never calculates an object plane [at the tangible object plane], but merely uses a virtual plane I_0 of a virtual camera view C_0."

Upon further review of the specification, a tangible object plane or tangible surface is calculated as shown in fig. 12, label PL via equation (7) and in figure 36,label: "PL" which corresponds to the claimed object plane. Lelong et al. calculates an imaging plane or virtual plane,C_0, and is silent with calculating a plane at the site of the tangible plane. Instead, Lelong et al. calculates the ray, PM, and the point, M, at the site of the tangible object plane. Lelong et al. is not too clear as to whether a plurality of points form a plane where a normal can be computed from the plane of points at the site of the tangible plane.

8. Applicant's arguments with respect to claim 26 on page 14 filed 6/8/2006 have been fully considered but they are not persuasive. See the rejection of claim 26, below.

9. Applicant's arguments on page 15, lines 2-5, filed 6/8/2006 have been fully considered but they are not persuasive and states:

> "Lee...does not teach...the calculation of a direction of the tangible object plane, the tangible object plane being defined by a spatial orientation of the tangible object."

However, the examiner respectfully disagrees since Lee (US Patent 6,507,366 B1) teaches the calculation of a direction of the tangible object plane (via the coordinate system of fig. 4 that provides coordinates that provide directions in the X,Y, and Z directions to find a plane, IMAGE PLANE (π) of fig. 4, of a tangible object, OBJECT in fig. 4), the tangible object plane being defined by a spatial orientation (or coordinate system (X,Y,Z) of fig. 4) of the tangible object.

Upon further review of the specification and in another interpretation, Lee does not teach the calculation of a **normal at** (emphasis added) the tangible object plane, the tangible object plane being defined by a spatial orientation of the tangible object."

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1,3-10 and 12-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Lelong et al. (US Patent 5,444,478 A).

Regarding claims 1 and 9, Lelong et al. discloses an image processing method and apparatus for correcting image distortions caused by oblique imaging in which a tangible object on an object plane is captured from different oblique directions to obtain a plurality of partially overlapping images, comprising the steps of:

a) a correspondence detecting unit (Fig. 3,num. 200 is used in a "calibration" in col. 16, line 63 via the method from col. 16, line 63 to col. 17, line 13) determining a feature point ("seam" in col. 16, line 47 and shown in fig. 1E, label: "L_0") of one of the plurality of partially overlapping images (in an "overlap zone" in col. 16, lines 49,50) corresponding to a common location of the tangible object (The building of figures 7A and 7B), shared by the plurality of partially overlapping images, and

b) determining a matched point of one of the other partially overlapping images corresponding to the feature point (to create "a perfect juxtapo-sition" in col. 16, lines 66,67) so that a direction (Fig. 5B, direction or line "PM".) of the tangible object plane (Fig. 5B, label" I_0") is calculated based on the feature point and the matched point (Note that the above mentioned perfect juxtaposition is interpreted as matching features of an image Si in fig. 7C to features of an image Sj in fig. 7C along a seam, L in fig. 7C to create a seamless image as shown in fig. 7D where no seam is visible and respective portions of the image such as the building and trees are matched to create "a uniform...image" in col. 17, lines 12,13.), the tangible object plane (fig. 5A, label: "M") being defined by a spatial orientation (of either the coordinate system ($y0,X_0,Z_0$) of an image I_0 or the coordinate system (Y,Z,X,Z_0) of a camera, "P" as shown in fig. 5A) of the tangible object;

c) a standard image setting unit (fig. 3,num. 205) selecting one ("selecting one" in col. 6, line 46) of the plurality of partially overlapping images (Fig. 6, num. 205) as a standard image (via a "reference...camera" in col. 9, line 66 that creates a "source image" in col. 9, line 67 which is interpreted as the claimed standard image) whose image distortions are to be corrected (as shown in fig. 7D relative to fig. 7C.); and

d) a distortion correcting unit (fig. 3,num. 112) generating a distortion-corrected image (fig. 7D) on a projection plane (or "projected in the...plane" in col. 8, line 11) by projecting the standard image onto the projection plane based on the direction of the tangible object plane such that image distortions in the standard image are eliminated.

Regarding claim 3, Lelong et al. discloses the image processing method according to claim 1 wherein in said selecting step, one of the plurality of partially overlapping images is automatically ("automatically" in col. 17, line 14) selected as the standard based on a direction of a straight-line pattern (fig. 1E, label: "L_0") contained in each image.

Claims 4 and 5 are rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claims 4 and 5.

Claim 6 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claim 6 except for the remaining limitations of:

a) selecting one of the plurality of partially overlapping images as a standard image (Fig. 6, num. 205) that contains a smallest amount of image distortions (via a "feedback" in col. 16, line 64 to create "a target image without any faults" in col. 16, lines 67,68. Thus, if a target image is created without any faults then the images that were used to create the target image also have no faults.) among the plurality of partially overlapping images; and

b) combining the other partially overlapping images, which are projected (as shown in fig. 1A via a plurality of lines that radiate from point "P".) onto an image surface (Fig. 1A, label: "I_0") of the standard image with respect to each of the other partially overlapping images, so that a composite image (fig. 7D) is generated on the image surface so as to correct image distortions in the standard image (relative to the image of fig. 7C).

Claim 7 is rejected the same as claims 1 and 9. Thus, argument similar to that presented above for claims 1 and 9 is equally applicable to claim 7 except for the limitation disclosed in Lelong et al. of:

a) an image composition unit ("Devices capable of realiz-ing these operations" in col. 17, lines 5,6 such as "perfect juxtapo-sition" in col. 16, lines 66,67.) combining (via a "joint" in col. 9, line 42) the other partially overlapping images, which are projected (as shown in fig. 1A via a plurality of lines that radiate from point "P".) onto an image surface (Fig. 1A, label: "I_0") of the standard image with respect to each of the other partially overlapping images, so that a composite image (fig. 7D) is generated on the image surface so as to correct image distortions in the standard image (relative to the image of fig. 7C).

Regarding claim 8, Lelong et al. discloses the image processing apparatus according to claim 7,

a) wherein said standard image setting unit (fig. 3,num. 205) is configured such that a user (via fig. 3,num. 2) is required to select the standard image when taking the original image from one of the oblique directions (Fig. 7A shows an image of a scene at one angle and fig. 7B shows another image of the same scene at another angle so that when both images are combined as shown in fig. 7C distortions are shown because the images of the same scene were taken at different angles.), and

b) wherein said image processing apparatus further comprises:

b1) a notification unit (Fig. 21,num. 2) which notifies the user that the standard image is currently taken (via fig. 3,num. 205).

Regarding claim 10, Lelong et al. discloses the image processing apparatus according to claim 9, further comprising:

a) a plurality of imaging units (Fig. 1G, label "P") which respectively input the plurality of partially overlapping images that are generated by taking the original image from the oblique directions.

Claims 12-14 are rejected the same as claims 3-5, respectively. Thus, argument similar to that presented above for claims 3-5 is equally applicable to claims 12-14, respectively.

Claim 15 is rejected the same as claims 1 and 9. Thus, argument similar to that presented above for claims 1 and 9 is equally applicable to claim 15 except for the additional limitation of a computer-readable storage medium as disclosed in Lelong et al. in fig. 3, num, 210.

Claim 16 is rejected the same as claims 7 and 15. Thus, argument similar to that presented above for claims 7 and 15 is equally applicable to claim 16.

Regarding claim 17, Lelong et al. discloses the image processing method of claim 1, wherein said standard image is projected with a perspective projection matrix operation (or " 'perspective transform'" in col. 14, line 57).

Claims 18-22 are rejected the same as claim 17. Thus, argument similar to that presented above for claim 17 is equally applicable to claims 18-22.

Regarding claim 23, Lelong discloses the image processing method of claim 17, wherein said perspective projection matrix is calculated based on coordinates (or "coordinates" in col. 14, line 61) of at least four combinations of feature points of the standard image and matched points corresponding thereto (via a "**4 X 4** matrix" in col. 14, line 62).

Regarding claim 24 see "least-squares method" in col. 15, line 17.

Regarding claim 25, Lelong et al. discloses the image processing method according to claim 1, wherein the tangible object is an image on a planar surface (or a "scene" in col. 2, line 27 that corresponds to the claimed image that has "surface area" in col. 2, line 27.

12. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Cahill et al. (US Patent 6,507,665 B1).

Regarding claims 1, Cahill et al. discloses an image processing method for correcting image distortions caused by oblique imaging in which a tangible object on an object plane is captured from different oblique directions to obtain a plurality of partially overlapping images, comprising the steps of:

a) determining a feature point (fig. 3,num. 13) of one of the plurality of partially overlapping images (fig. 3,numerals 13 and 16) corresponding to a common location (fig. 3,num. 18) of the tangible object, shared by the plurality of partially overlapping images, and

b) determining a matched point (fig. 3,num. 15) of one of the other partially overlapping images corresponding to the feature point so that a direction (fig. 3,num. 17) of the tangible object plane is calculated based on the feature point and the matched point, the tangible object plane being defined by a spatial orientation (as shown in fig. 3 that shows a space of points) of the tangible object;

c) selecting one of the plurality of partially overlapping images (either image of fig. 3,numerals 14 and 16 that is represented in fig. 5B,num. 36) as a standard image whose image distortions (that are "inherent" in col. 7, line 54) are to be corrected (via fig. 2,num. 8); and

d) generating a distortion-corrected image (fig. 5B,num. 36) on a projection plane (or cylinder) by projecting the standard image onto the projection plane based on the direction of the tangible object plane (as determined in fig. 2,num. 5) such that image distortions in the standard image are eliminated.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lelong et al. (US Patent 5,444,478 A) in view of Lee (US Patent 6,507,366 B1).

Regarding claim 2, Lelong et al. teaches the image processing method according to claim 1 wherein in said selecting step, one of the plurality of partially overlapping images is automatically (or "automatically" in col. 17, line 14) selected (via fig. 3,num. 2 which can be an automatic process that selects the standard image via fig. 3,num. 205.) as the standard image.

Lelong et al. does not teach the remaining limitation of selecting the standard image based on a ratio of an area of an object region to an entire area of each image, but does teach an "automatic function" in col. 4, line 61 for "monitor[ing]" in col. 4, line 40. Thus, Lelong et al. suggests that an automatic process can be used for monitoring automatically, but does not provide enough details on the automatic aspect of monitoring. Thus, one of ordinary skill in the art will be motivated to find an automatic process of monitoring so that a person is freed from monitoring a scene and so that the person can perform other duties.

Lee teaches "monitoring" in col. 1, line 12 and "automatically tracking" in the abstract as taught in Lelong et al. and the remaining limitation of claim 2:

a) selecting (via fig. 3A,num. 360) based on a ratio of an area of an object region (or "region ratio" in col. 9, line 1) to an entire area (or "effective region" in col. 9, line 3) of each image.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Lelong et al.'s teaching of selecting the standard image and automatic monitoring with Lee's teaching of selecting or automatic tracking via fig. 3A,num. 360 so that Lelong et al's selecting the standard image, either one of I_j shown twice as shown in fig. 1E of Lelong et al. can be automatically tracked or monitored freeing a person from monitoring to perform other duties.

Claim 11 is rejected the same as claim 2. Thus, argument similar to that presented above for claim 2 is equally applicable to claim 11.

15. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lelong et al. (US Patent 5,444,478 A) in view of Honma (US Patent 6,304,313 B1).

Regarding claim 26, Lelong et al. does not teach the limitations of claim 26 of a smallest inclination angle of a viewing direction of the oblique imaging, but does teach that "All the means for correct-ing the distortions of the objectives may be known to those skilled in the art." in col. 14, lines 4,5. Thus, Lelong et al. suggests to one of ordinary skill in the art that any means can be used to correct distortions of an objective.

Honma teaches a means of correcting a distortion using "perspective correction" in col. 13, line 20 of an objective or "optical lens" in col.13, line 20 and the remaining limitation of:

a smallest inclination angle (or "correctly face[d]" in col. 11, line 2) of a viewing direction (of a "camera" in col. 11, line 1.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Lelong et al.'s teaching of a means to correct distortions of an objective with Honma's teaching of perspective correction, because Honma's teaching provides a "[simple] lens" in col. 13, line 21 with "less cost than conventional devices." in col. 13, line 25.

In addition, Honma's teaching of when correctly facing a camera, "perspec-tive correction is unnecessary" in col. 11, lines 3,4. Thus, extra time is saved by bypassing the step of perspective correction when the camera is correctly faced.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yano et al. (US Patent 6,590,704 B1) is pertinent as teaching a method of correcting distortion of two views as shown in fig. 28A-28C.

Myers et al. (US Patent 6,278,460 B1) is pertinent as teaching a method of matching points in fig. 17,num. 1713 for later ray casting which is interpreted to be a direction that calculates a 3-D model.

Katayama et al. (US Patent 5,668,595 A) is pertinent as teaching a method of keystone correction of two matching points, fig. 6, labels: A_L and A_R, that correspond to a common point A of fig. 6.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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